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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Maxime Moreno

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EXAMINER

LEUNG, JENNIFER A

ART UNIT

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1797

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/659,522	<b>Applicant(s)</b> MORENO ET AL.	
	<b>Examiner</b> JENNIFER A. LEUNG	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 24, 2008 has been entered.

### *Status of the Claims*

2. Claims 3 and 5-10 are cancelled. Claims 16 and 17 are newly added. Claims 1, 2, 4 and 11-17 are under consideration.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Schutte et al. (WO 02/18042).

Regarding claim 1, Schutte et al. discloses a chemical processing apparatus comprising: a pressure vessel (i.e., vessel **25** with lid **28** and bottom **7**; see FIGs. 8 and 10); a microreactor disposed within the pressure vessel (i.e., a block **24** comprising reaction spaces **3** between adjacent wall elements **1**; the reaction spaces **3** having a slot width “s” between 0.05 and 5 mm; see FIG. 4; see page 17, lines 17-23); the microreactor comprising a material such as metal (see

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page 19, lines 23-25); wherein the apparatus further comprises a heat conductive medium communicating with the microreactor, arranged and positioned so as to be capable of providing thermal exchange between the microreactor and the pressure vessel (i.e., a distributing medium **37** or **38**, positioned in contact with the microreactor and the pressure vessel, comprising a metal block or a packing material that consists of heat-conducting particles, for example sand, grit, metal shavings, metallic fibers or such like on a sieve plate; see FIGs. 8 and 10; see page 21, lines 20-24 and page 22, lines 17-21); wherein the apparatus further comprises an inlet line passing through the pressure vessel wall (i.e., via **34** or **35**), the inlet line positioned and arranged so as to be able to introduce one or more fluids **R1**, **R2** to be processed into the microreactor; and an outlet line passing through the pressure vessel wall (i.e., via **33**), the outlet line positioned and arranged so as to be able to remove one or more processed fluids from the microreactor.

Regarding claim 2, an autoclave, by definition, is a vessel used for conducting chemical reaction under high pressure. Thus, the pressure vessel **25/7/28** of Schutte et al. meets the claim (see, e.g., page 9, lines 19-20).

Regarding claim 16, the inlet line **34**, **35** is positioned and arranged so as to be capable of introducing into the volume surrounding the microreactor within the pressure vessel, one or more fluids to be processed (i.e., the fluid supplied by lines **34**, **35** ultimately exits the bottom of the reaction spaces **3** and fills the pressure vessel, e.g., for further reaction with a third reactant **R3**; see FIGs. 8, 10).

Regarding claim 17, the outlet line **33** is positioned and arranged so as to be capable of withdrawing from the volume surrounding the microreactor within the pressure vessel, one or more of the one or more processed fluids (see FIGs. 8, 10).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 4 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schutte et al. (WO 02/18042) in view of Kawai et al. (US 5,447,624).

Schutte et al. discloses that the heat conductive medium **38** comprises a packing material that consists of heat-conducting particles, for example sand, grit, metal shavings, metallic fibers or such like. The particles are sized such that narrow interspaces are defined by the heat conductive medium **38** (see page 22, lines 16-26). Schutte et al., however, is silent as to the packing material comprising SiC in particulate form, wherein the particle size is between about 5.0 microns and 1000.0 microns, or between about 100.0 microns and 500.0 microns.

Kawai et al. teaches a packing material comprising SiC in particulate form, wherein the particle size is between about 5.0 microns and 1000.0 microns, or between about 100.0 microns and 500.0 microns (i.e., microspherical porous silicon carbide, with a particle diameter of 2 to

200 microns; column 2, lines 1-19).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute the SiC packing material of Kawai et al. for the packing material forming the heat conductive medium **38** in the apparatus of Schutte et al., on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the SiC packing material has excellent chemical resistance, solvent and thermal resistances, and high mechanical strength, as taught by Kawai et al. (see column 1, lines 61-67). Furthermore, the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958), and when the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result, *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (2007).

5. Claims 1, 2 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (JP 09-085075) in view of Swift et al. (US 4,670,404).

Regarding claim 1, Suzuki et al. (see, e.g., FIG 5; see Abstract and full Machine Translation) discloses a chemical process apparatus comprising: a pressure vessel (i.e., a pressure resistant container **1**); a reactor (i.e., a reaction container **2**) disposed within the pressure vessel; wherein the pressure vessel is constructed and arranged to maintain the pressure vessel and the reactor at an elevated pressure when a chemical operation is performed within the apparatus; wherein the reactor **2** comprises a material such as ceramic, a polymer such as plastic, or a metal such as nickel alloy, iron alloy or carbon steel, depending on use (see section [0005]); wherein the apparatus further comprises a heat conductive medium communicating with the reactor **2** and

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arranged and positioned so as to be capable of providing thermal exchange between the reactor and the pressure vessel **1** (i.e., a gas or fluid pressure medium **E**, such as air, water or oil, may be introduced to the cavity part **B**. This medium will inherently function as a thermal exchange medium for transferring and conducting heat from the reactor **2** wall to the pressure vessel **1** during use; see section [0015]); wherein the apparatus further comprises an inlet line **51** passing through the pressure vessel wall, the inlet line **51** positioned and arranged so as to be able to introduce one or more fluids to be processed into the reactor **2** (see FIG. 5); and an outlet line **53** passing through the pressure vessel wall, the outlet line **53** positioned and arranged so as to be able to remove one or more processed fluids from the reactor **2** (see FIG. 5), whereby continuous processing of the fluids at high pressures may be achieved.

Suzuki et al., however, is silent as to the reactor **2** comprising a microreactor.

Swift et al. (see FIG. 1; column 5, lines 1-59) teaches a pressure vessel (i.e., containment unit **12**, with sidewall **102** and top **104**) and a micro-scale reactor (i.e., test vessel **10**) disposed within the pressure vessel. It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the reactor **2** in the apparatus of Suzuki et al. as a micro-scale reactor, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the micro-scale would allow for the safe simulation of full-scale chemical processes prior to full-scale implementation, as taught by Swift et al.

Furthermore, it has been held that changes in size involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955).

Regarding claim 2, an autoclave, by definition, is a vessel used for conducting chemical reaction under high pressure. Thus, the vessel **1** of Suzuki et al. meets the claim.

Regarding claim 14, Suzuki et al. discloses that the medium **E** is pressurized within the volume **B** of the pressure vessel **1**, in order to maintain the volume **B** and the volume **A** within the reactor **2** at substantially the same pressure (see FIG. 5). Thus, the medium **E** inherently acts as support for the walls of the reactor, by counteracting the outward pressure on walls of the reactor when its contents are pressurized.

Regarding claim 15, Suzuki et al. discloses that the reactor **2** may be constructed of a heat conductive material, e.g., a metal such as a nickel alloy, an iron alloy, or carbon steel. Similarly, the pressure vessel **1** may be constructed of a heat conductive material, e.g., a metal such as carbon steel or stainless steel (see section [0005]). Also, the medium **E** provided within the volume **B** may comprise a heat conductive material, such as water or oil (see section [0015]). Thus, the modified apparatus of Suzuki et al. is structurally capable of achieving temperature control, by controlling the temperature of the pressure vessel **1** rather than by directly controlling the temperature of the reactor **2** itself, since each of the materials of the apparatus are inherently capable of conducting heat.

Regarding claims 16 and 17, Suzuki et al. further discloses that the inlet line may be positioned and arranged so as to be capable of introducing into the volume **B** surrounding the reactor within the vessel, a fluid to be processed (see, e.g., line **21** in FIG. 2; line **32** in FIG. 3; line **42** in FIG. 4). Suzuki et al. also discloses that the outlet line may be positioned and arranged so as to be capable of withdrawing from the volume **B** surrounding the reactor within the vessel, a processed fluid (see, e.g., line **24** in FIG. 2). In each case, the fluid supplied to the volume **B** inherently functions as a heat conductive medium, capable of transferring heat from the reactor **2** wall to the pressure vessel **1**.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1, 2, 4 and 11-17 have been considered but are moot in view of the new ground(s) of rejection, necessitated by amendment.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. LEUNG whose telephone number is (571)272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A. Leung/  
Primary Examiner, Art Unit 1797